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dried material may be seen on the upper side of the leaf. In *S. natans* the leaves are elliptical, the trichomes borne on low papillae, and the veins imbedded in the tissues of the leaf and very obscure. The variety *Olfersiana* differs from typical *S. auriculata* in having smaller and much thinner leaves (in dried material,—they are rather thick and fleshy in the living plant) with only 15–30 lateral veins on each side, and in the much greater hairiness of all the submerged parts, including the sporocarps. It is possibly a distinct species, and is so treated by Britton in the Flora of Bermuda where there is an excellent figure which might easily have been drawn from the plant now growing at the University of Minnesota.

Both *S. auriculata* and the variety are natives of tropical America, and there is no evidence that either of them will survive a northern winter in the open. Thus it becomes even more improbable that the supposed Minnesota plant is really a native of this state, or has ever lived there outside of greenhouses, except possibly as a brief-lived escape during the summer.

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OTHER RECORDS OF SALVINIA NATANS IN THE UNITED STATES.—Besides Minnesota, three other localities for *Salvinia natans* are given in current manuals. Some account of them may be of interest as a supplement to Professor Butters's note.

The earliest report of the species is in Pursh's Flora of North America, where it is said to have been found "floating like *Lemna* on the surface of stagnant waters in several of the small lakes in the western part of New York." No subsequent botanist has been able to find the plant in this region: we must conclude either that it did not become permanently established, or that it

is one of several very dubious records which Pursh, by no means the most accurate of botanists, admitted into his flora and which are now generally believed to be without foundation of fact.

A second New York locality is on Staten Island. In regard to this, Mr. William T. Davis of New Brighton, in response to a request for information, very kindly writes as follows:

"The so-called *Salvinia natans* was first reported by Mr. Thomas Craig from a pond near the Moravian cemetery where he and I collected specimens, and where it was evidently planted along with a number of other aquatic plants. Mr. Craig also found it in Silver Lake, which has since become a reservoir. Under the heading '*Salvinia natans* on Staten Island,' Mr. Craig gave an account of his discovery of the plant in the Proceedings of the Natural Science Association of Staten Island for October 14, 1893

At a later date I find that I made the following notes in my journal: 'Sunday, April 3, 1899. I planted *Salvinia natans* in Ketchem's Mill Pond, as I did last spring. I have not been able to find that any planted last year lived over winter.' 'September 23, 1899 (Saturday). In the spring I planted some *Salvinia natans* in Ketchum's Mill Pond and now there are countless numbers of fine plants.'

"This *Salvinia* did not survive the winter, and the specimens reported by Mr. Craig were doubtless, like mine, planted shortly before he collected them."

It is not surprising that the Staten Island *Salvinia*, though growing vigorously for a short time, could not be made to live through a winter, for specimens of it, which I have had the privilege of examining at the New York Botanical Garden and at the Gray Herbarium, prove to be, like the Minnesota material, *S. auriculata*, var. *Olfersiana*.

The fourth locality given in the manuals is in Missouri. Of this, Rev. C. H. Demetrio, the original and only collector of the plant there, has obligingly furnished the following account:

“Like many other things, *Salvinia natans* was found accidentally. After a botanical excursion in the bluffs of the Bois-brulé Bottoms of Perry Co., Mo., we—my friends and I—were on the homeward way, passing Dixon’s Lake. I left the wagon to gather some *Azolla caroliniana*. I took a stick and fished out a bulk of nearly everything. I put the bulk in my botanical tin case because I had no time to clean up everything. The next day I found, besides the *Azolla*, tangled in decaying leaves of *Potamogeton* and other stuff, some plants with sporocarps in the form of little balls. I sent a sample to the world-known Nestor of Botany, Prof. Dr. Asa Gray. He pronounced it *Salvinia natans* . . .

A month after the discovery of *Salvinia* I got a call from Emma, Mo., where I arrived December 9, 1886. Since that time I have never seen Dixon’s Lake again. I am therefore not able to state whether the *Salvinia* is growing there, indigenous or spontaneous. The land is low, somewhat swampy and subjected to overflow by the water of the Mississippi River”

Mr. Demetrio’s specimen, sent to Dr. Gray, is preserved at Cambridge and is true *Salvinia natans*. Mr. B. F. Bush and Mr. E. J. Palmer, who have collected very extensively in Missouri in recent years, state that they have never met with the plant.

The claim of *Salvinia natans* to a place in our flora rests, then, on one ancient and very doubtful report, two mis-identifications, and a single authentic collection, never repeated, at a station which has not been re-discovered in 35 years. It surely should not, at present be included in our manuals. There seems, however, to be no reason why true *S. natans* might not become naturalized with us (as its relative, *Azolla*

caroliniana, has become at some places in Europe); for it is not, like *S. auriculata*, a tropical species, but one of wide distribution in northern Eurasia where it must needs endure winters as severe as ours.—C. A. W.

IS BOTRYCHUM DISSECTUM A STERILE MUTANT OF *B. OBLIQUUM*?—The question in the title, “Is *Botrychium dissectum* a sterile mutant of *B. obliquum*,” is based on a recent article by C. J. Chamberlain in the Botanical Gazette (70: 387) under the title, “Grouping and mutation in *Botrychium*.” The question is raised in the present instance, not with the idea of casting doubt on Prof. Chamberlain’s conclusions, but because the problem is one to which readers of the FERN JOURNAL should be able to contribute additional information. Will you not look over the following summary of the Chamberlain article for the purpose of comparing its data with your own collecting experience or of making it the basis of special study in the coming season? We shall then be glad to hear reports from as many people and places as possible.

Botrychium is reported as almost invariably growing in groups of individuals, not as isolated plants. By “groups” in this case the writer does not mean necessarily that the plants will be clumped together, but that in a patch of thicket where one plant is found, others are almost certain to exist. Several such woods groups are shown plotted on cross-section paper, in Prof. Chamberlain’s article, with the location of each individual plant marked, and with different marks for different species of *Botrychium*.

Of particular importance to the present topic is another observation, that *B. dissectum* never occurs except in association with *B. obliquum*, and then always in smaller numbers. In four plots, mainly in different